

PATENT SPECIFICATION

949,811

DRAWINGS ATTACHED.

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COMPLETE SPECIFICATION.

Improvements in or relating to Securing Inserts in Sheet Material.

We, BELLING & LEE LIMITED, a British Company of Great Cambridge Road, Enfield, Middlesex, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to securing inserts on sheet material and particularly to a method of securing an insert on sheet material to resist torque-existing forces thereon.

According to one aspect of the present invention there is provided a method of securing an insert in sheet material which method comprises forcing a non-pointed spigot having a flange at one end into sheet material by pressure applied by a pressure applying device associated with a die, between which pressure applying device and die the insert and sheet material are placed, the spigot acting as a punch to make its own aperture in the sheet material, the fall of the flange adjacent the spigot being so formed and pressure being applied to such an extent that the said fall of the flange is stacked to the face of the sheet material with which it is in contact to resist torque exerting forces applied to the insert and/or sheet material.

The said face of the flange is preferably of polygon cross section and is staked to the sheet material at the corners thereof. In a preferred embodiment, said face is square in cross section but concave when viewed from the spigot end so that each corner of the face is pointed to act as a stake which bites into the sheet material.

According to another aspect of the present invention there is provided an insert for use in the said method consisting of a non-pointed spigot having at one end a

square section flange which is concave when viewed from the spigot end so that each corner of the flange is pointed.

The spigot is preferably threaded and also preferably is linked to a flange by an enlarged portion of greater cross sectional diameter than the spigot. This enlarged portion enlarges the aperture made by the spigot, and preferably has its periphery so formed to key into the enlarged aperture, for example, by knurling such as grooves and ridges of V shaped cross section running parallel to the longitudinal axis of the insert. As the spigot and enlarged portion punch out a washer from the sheet material and such a washer has to be detached from the spigot, a chamfer is provided to link the spigot and enlarged portion.

This chamfer enlarges the aperture in the washer made by the spigot so that the washer is readily detachable from the spigot.

The invention will now be described with reference to the drawings accompanying the Provisional Specification in which:—

Figure 1 is a side elevation of an insert for use in a preferred embodiment of the method of the present invention;

Figure 2 is an inverted fragmentary perspective view of the flange part of the insert of Figure 1;

Figure 3 is a sectional side elevation partly in section of an arrangement for carrying out a said preferred embodiment of the method of the invention; and

Figure 4 is a sectional side elevation showing the insert after securing to the sheet material.

In Figure 1 a threaded spigot 1 is attached to a shank 2 of larger cross section than the spigot and knurled as 3 with V cross section grooves and notches running parallel to the

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vertical axis of the shank in Figure 1 the spigot and shank being joined by a chamfer 4. The shank 2 terminates in a flange head 5 of square cross section. As seen in Figure 2, the face 6 of flange 5, when viewed from the spigot end of the insert is concave, that is to say its four corners 7 to 10 inclusive are points. When the insert is forced into a sheet of material 11 resting on a die 12 by the ram 13 of a pressure applying device (not shown) as in Figure 3, the spigot first punches out a disc of material 14 and forces it into the bore 15 of the die 12 as at 14a in Figure 3. On continuing the pressure application and in the same stroke of the ram, the shank 2 enlarges this aperture by punching out a washer represented by 16 in Figure 3 from the sheet material. The hole in such a washer is initially of the same diameter as spigot 1 because it has been punched out by this spigot when removing disc 14 from the sheet material. However, this hole is enlarged by the chamber 4 so that the washer drops off spigot 1. Continuing application of pressure then forces the pointed corners 7 to 10 inclusive into the top face 17 of the sheet 11, thereby staking the flange 5 to the sheet material to resist the action of torque exerting forces on the resultant assembly of sheet material and insert.

This final assembly is shown in section in Figure 4, which is a section through a median plane of the assembly. The staked corners 7 and 8 are shown in dotted line because the staked corners are not situated in a median plane but behind, in front of, or on each side of such a plane.

It will be appreciated that the invention results in a torque resisting assembly of sheet material and insert in a single stroke of a pressure applying device as no pre-drilling is necessary. It will also be appreciated that as well as being fixed by staking the insert is keyed to the sheet material by the same stroke of said device as performs the staking operating.

Although the invention has been described with reference to a simple flange 5, this flange may be part of some other constructional part or may have another constructional part, for example, another threaded spigot, associated therewith so that a multiplicity of articles may be secured in a torque resisting manner to sheet material by the technique of the invention.

WHAT WE CLAIM IS:—

1. A method of securing an insert in sheet material which method comprises forcing a non-pointed spigot having a flange at one end into sheet material by pressure applied by a pressure applying device associated with a die, between which pressure

applying device and die the insert and sheet material are placed, the spigot acting as a punch to make its own aperture in the sheet material, the face of the flange adjacent the spigot being so formed and pressure being applied to such an extent that the said face of the flange is staked to the face of the sheet material with which it is in contact to resist torque-exerting forces applied to the insert and/or sheet material.

2. A method as claimed in Claim 1 in which the face of the flange is of polygon cross section and is staked to this flange at the corners thereof.

3. A method as claimed in Claim 2 in which said face is square but concave when viewed from the spigot so that each corner is pointed to act as a stake which bites into the sheet material.

4. An insert for use in the method of Claim 3 and consisting of a non-pointed spigot having at one end a square section flange, which is concave when viewed from the spigot end so that each corner of the flange is pointed.

5. A method as claimed in any of the Claims 1 to 3 or an insert as claimed in Claim 4 in which the spigot is threaded.

6. A method as claimed in any of the Claims 1 to 3 or 5 or an insert as claimed in Claim 4 or 5 in which the spigot is linked to the flange by an enlarged portion of greater cross sectional dimensions than the spigot.

7. A method or insert as claimed in Claim 6 in which said enlarged portion has its periphery so formed to key into the aperture formed in the sheet material.

8. A method or insert as claimed in Claim 7 in which said enlarged portion is knurled by grooves and ridges of V shaped cross section running parallel to the longitudinal axis of the insert.

9. A method or insert as claimed in any of the Claims 6 to 8 in which a chamfer is provided to link the spigot and enlarged portion.

10. A method of securing an insert in sheet material substantially as herein described with reference to the accompanying drawings.

11. An insert substantially as herein described with reference to the accompanying drawings.

12. An article consisting of sheet material having an insert secured therein by the method claimed in any of the Claims 1 to 3 or 4 to 10.

For and on behalf of
BELLING & LEE LIMITED,
C. RUSSELL TOWNSEND,
Director and Secretary.

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PROVISIONAL SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

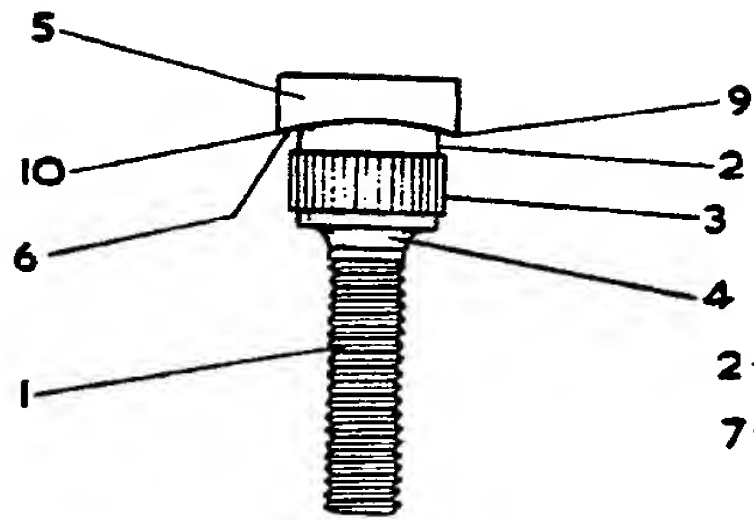


FIG. 1

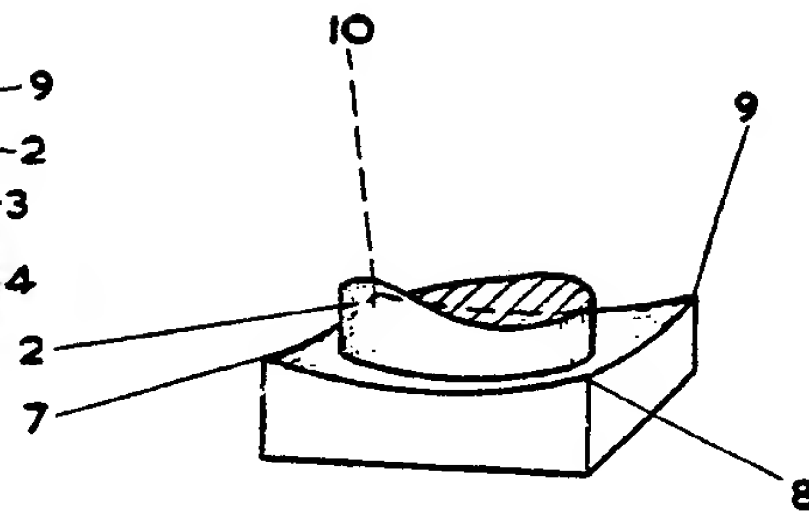


FIG. 2

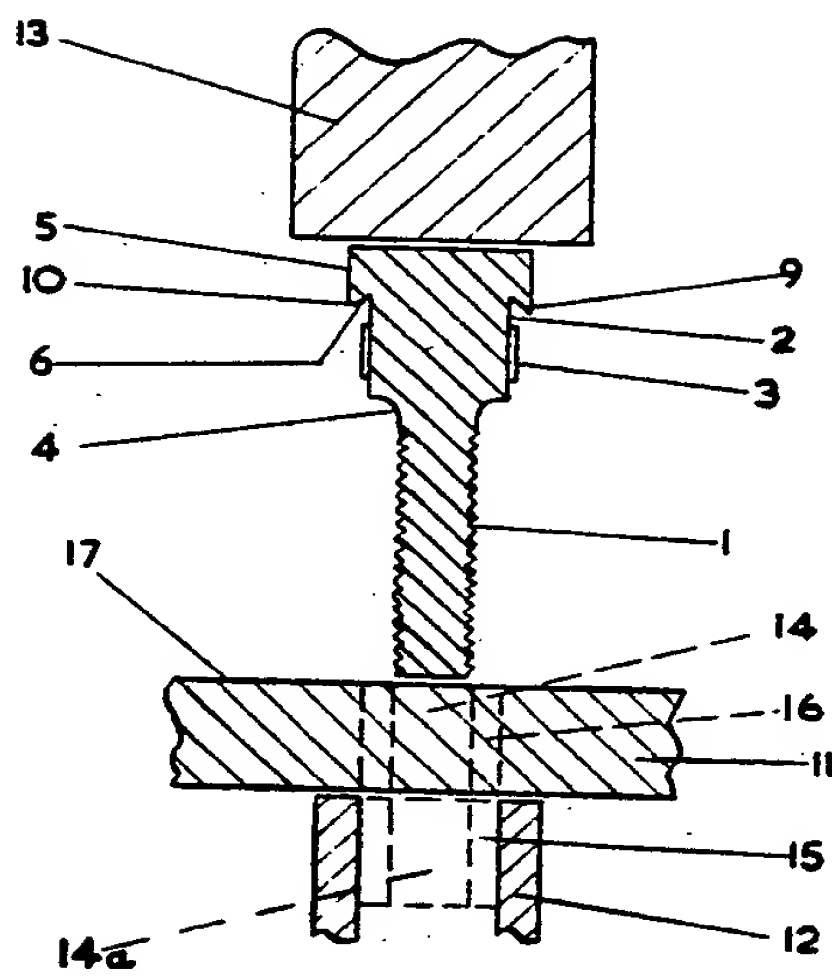


FIG. 3

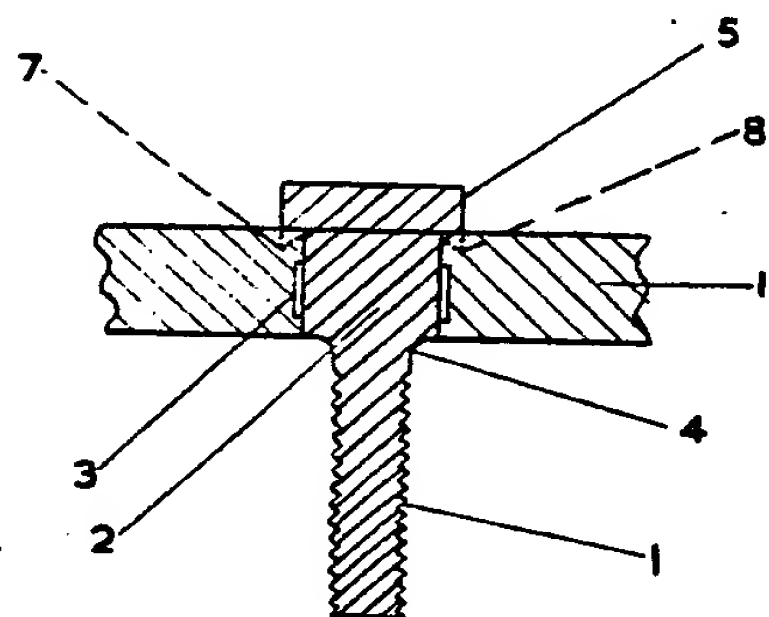


FIG. 4

